Empirical Analyses of Potential Coordinated Effects from A Merger

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* Opinions are those of author, not necessarily those of the Commission or individual Commissioners

Introduction

- The current state of competition in a market is one important component of the evidence used to assess the potential competitive effects of a merger

- For example, in a **Unilateral Effects** theory, if the parties to the merger are particularly "close" and vigorous competitors that is an important basis for a unilateral effects case

- The relationship between the existing state of competition and potential competitive effects arising from **Coordinated Interaction** is more complex

Introduction

- The current state of competition is relevant to assessing the viability of a coordinated interaction theory:
  - Evidence consistent with some sort of existing coordinated interaction may lead to a conclusion that the merger may result in the existing C.I being more easily maintained or strengthened as a result of the merger
  - The merger may significantly change the nature of competition, *i.e.*, result in some sort of tacit "collusion"
    - The "traditional" approach has been to focus on the "factors facilitating collusion"
  - The merger may remove a "maverick" that has been important to the vigor of competition

Four Theories of Merger Effects

- "Small Numbers"
- Dynamic Oligopoly Theory
- Existing Effective Coordination
- Removal of A Maverick

Small Numbers: Discussion

- Industry factors suggest that one can have a presumption that reducing the number of players is likely to cause prices to go up
  - 3 to 2 mergers in a well defined market with entry barriers
  - Evidence shows that the number of competitors matters

Small Numbers: Quantitative Evidence

- **Empirical Analyses of pricing with different numbers of competitors over time or across geography – i.e., "Natural Experiments"**

Dynamic Oligopoly Theory: Discussion

- Through repeated interaction may be able to achieve higher prices as a group then if behaved independently

- Requires ability to reach **CONSENSUS,** **DETECT DEVIATIONS,** and **PUNISH** such deviations

Dynamic Oligopoly Theory: Discussion

- Must show how a merger makes "passing" the Consensus, Detection, Punishment test more likely or effective:
  - Existing Effective Coordination
  - Merger Removes Impediments to Coordination (such as a Maverick)

Dynamic Oligopoly Theory: Quantitative Evidence

- **Empirical Analyses focused on the specifics of the current state of competition**

Examples of Quantitative Analyses

- **Detailed analysis of pricing across customers**
  - **How much variability exists across customers (in cross section and over time)**
  - **Are differences "systematic?"**
- **Comparison of price movement across competitors**
  - **Are movements common?**
    - **Note: Common movements do not mean coordination**
  - **Does relative pricing stay stable?**

Examples of Quantitative Analyses

- **Trends in output, capacity and customer shares**
  - **Is there much customer turnover?**
  - **Are output and capacity shares stable?**

- **New product introductions**
  - **How common are such introductions?**
  - **How important to sales?**

Transparency and Complexity

- The consensus, detection, punishment paradigm require sufficient ***Transparency*** and ***Simplicity*** for C.I. to be a significant concern

- ***Transparency*** **of prices, output, capacity and who supplies which customer is important to assessing ability to reach consensus / detect deviations**

- ***Complexity*** of the market situation is relevant to the viability of Consensus, Detection, and Punishment

- **Some of above analyses are relevant to these points:**
  - **E.g., Variability in prices over time and at a point in time**

Transparency

- **Other Empirical Analyses:**
  - **Comparison of actual prices, volume, capacity to estimates by competitors**
  - **Comparison of published information to actuals**
  - **Analysis of capacity changes – are these "lumpy" or incremental**

Complexity

- Examples of Analyses:
  - Analysis of the variety of products being offered and whether there is a systematic relationship in prices
  - Analysis of the degree of variability in demand or cost conditions
  - Analysis of the role of new product introductions

Existing Coordinated Interaction

- Many of the above analyses are relevant to "testing" whether there is existing coordinated interaction

- Additional empirical analyses can be used to assess whether outcomes appear consistent with specific theories of coordinated interaction

Example: Price Leadership

- **Analysis of list prices**
  - **Is there a "leader" of price announcements?**
  - **How frequently do competitors follow list price announcements?**
  - **Do transaction prices systematically follow list prices?**

Maverick Theory: Empirical Evidence

- What evidence exists that one of the parties is a maverick? Above analyses can be relevant:
  - List price announcement
  - Customer turnover
  - Capacity changes
  - Price movements generally
- What information exists on why the firm is maverick?
  - Costs
  - Capacity
  - Share
  - Products

Conclusion

- Detailed empirical analyses, where data is available, are important to assessing the likelihood of coordinated interaction
- I have presented examples of potential analyses
- More research in this area would be useful

Appendix

Examples of Empirical Analyses

Examples Regarding
Analysis of Current Competition

Variability Across Customers At A Point In Time

- Following slide shows an analysis of pricing across customers in an industrial products industry.

- Customers were sorted by size (top 25 and top 10) and end use segment. Average prices per year for each customer were calculated and sorted from high to low within each segment. The difference between the high and low price was then calculated for each segment. The table shows this difference as a percentage of the weighted average price within a segment.

- This analysis shows substantial variation even among similar customers.

Variation in Prices Across Customers

Variation in Prices
Example 1: Based on Data from Actual Case

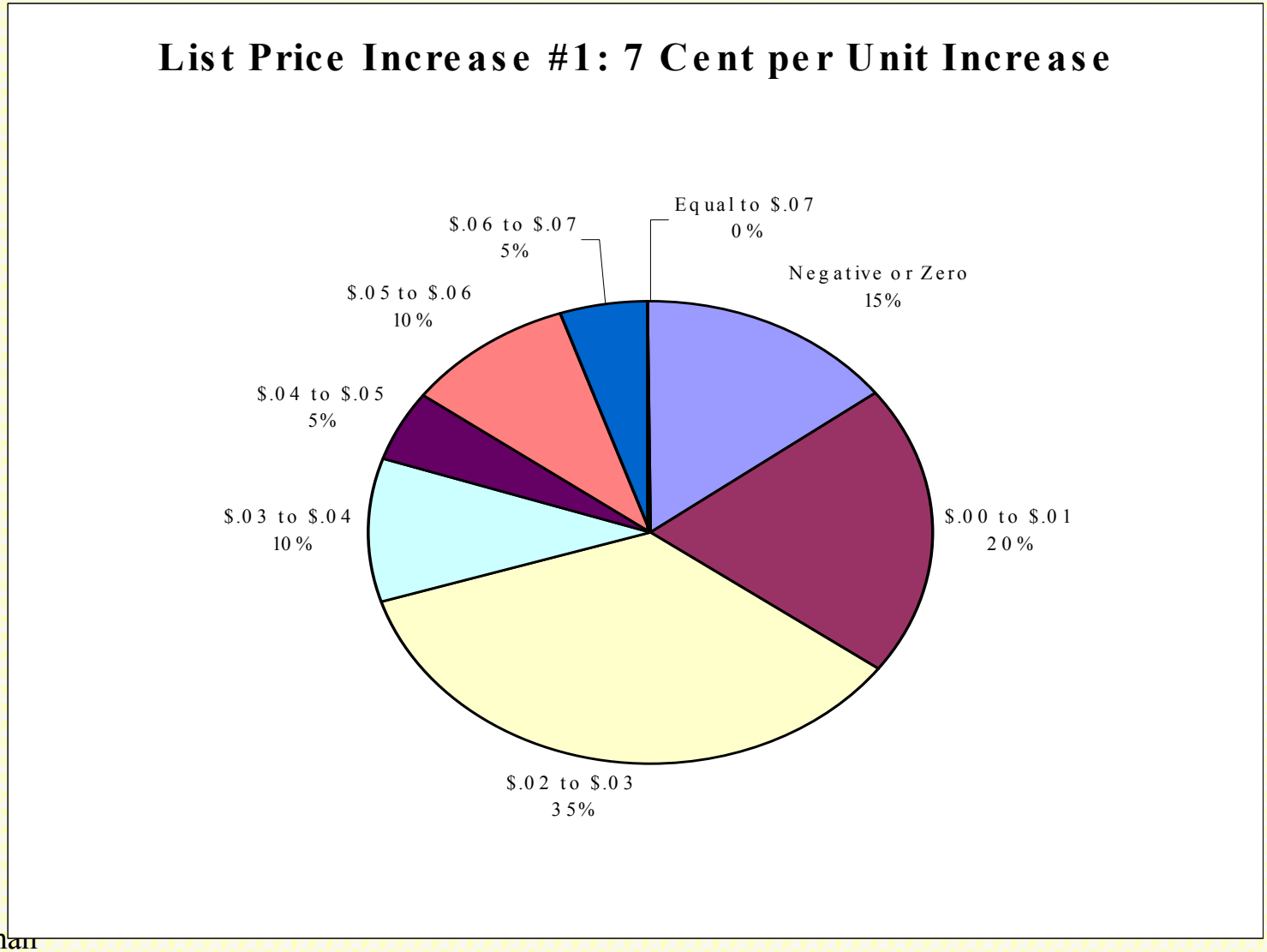
Range in Prices Paid by Company X's Top 25 Customers as a Percentage of the Weighted Average Price by End Use Segment			
Year	Segment A	Segment B	Segment C
19xx	9%	15%	19%
19xx+1	10%	11%	21%
19xx+2	11%	14%	17%
19xx+3	12%	22%	26%

Range in Prices Paid by Company X's Top 10 Customers as a Percentage of the Weighted Average Price by End Use Segment			
Year	Segment A	Segment B	Segment C
19xx	7%	11%	5%
19xx+1	6%	11%	2%
19xx+2	11%	13%	5%
19xx+3	12%	15%	16%

Variability In Changes in Prices Across Customers

- Following slide shows an analysis of changes in pricing across customers for the same industry as the previous slides.
- A list price increase announcement of was selected.
- For each of the top 25 customers in a segment, the change in price from the time of the announcement to three months after the announcement was calculated.
- The following chart shows the distribution of these price changes across customers (by volume).
- This analysis shows substantial variation in the amount by which prices changed.

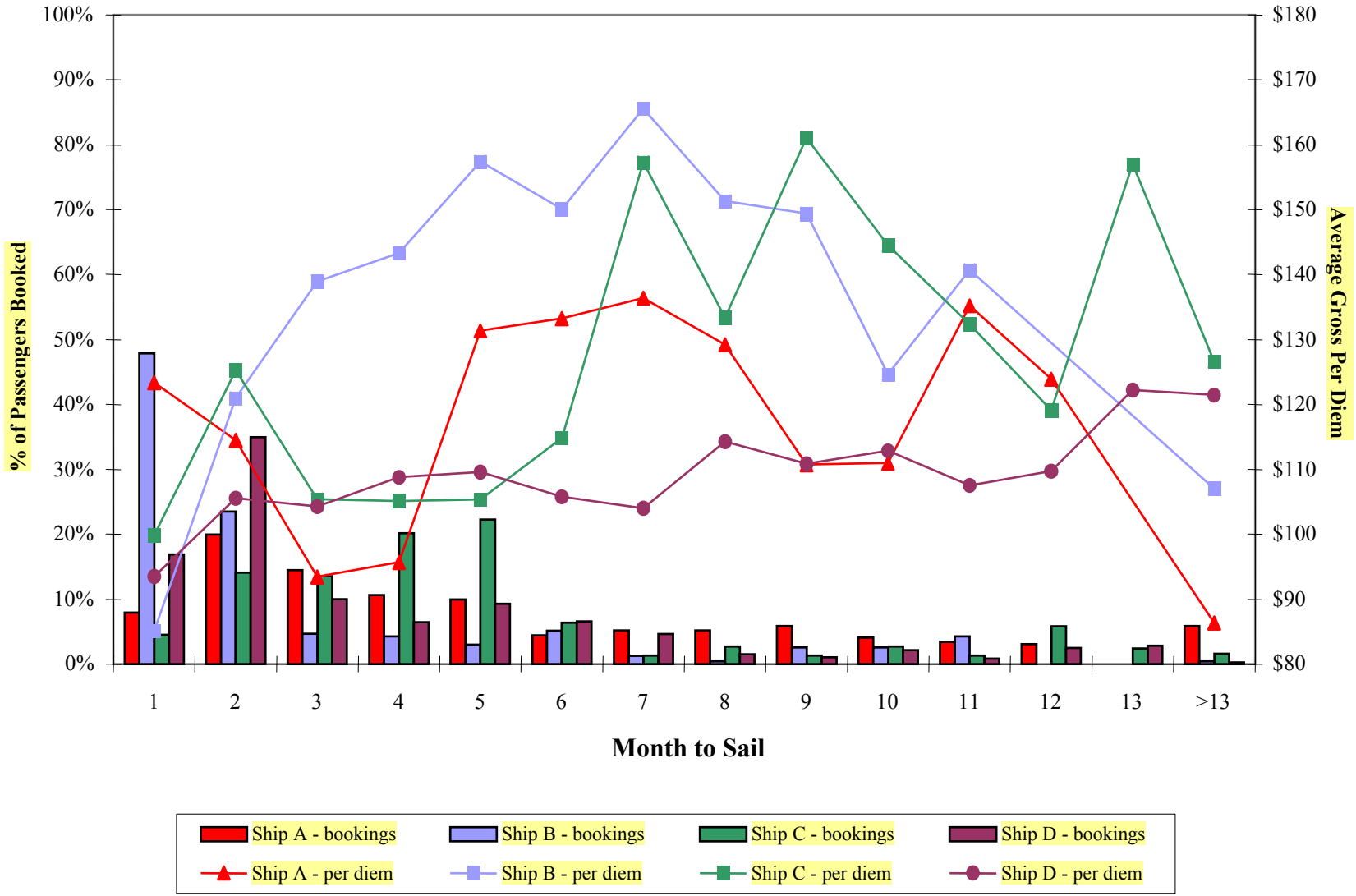
Variation in Price Changes



Variation in Pricing Across Competitors

- **Industry: Cruise lines**
- **Purpose: assess the relationship of pricing across competitors**
- **Data used:**
  - Transaction data from the parties with information on prices paid by passengers, what cabin they sailed in and when they booked.
- **Method:**
  - Select four **competing** ships that sailed from the same port in the same week with a similar itinerary.
  - For each 30 day period prior to sailing for **a cabin category**, calculate the average price paid during that period and how many cabins booked for each of the four sailings.

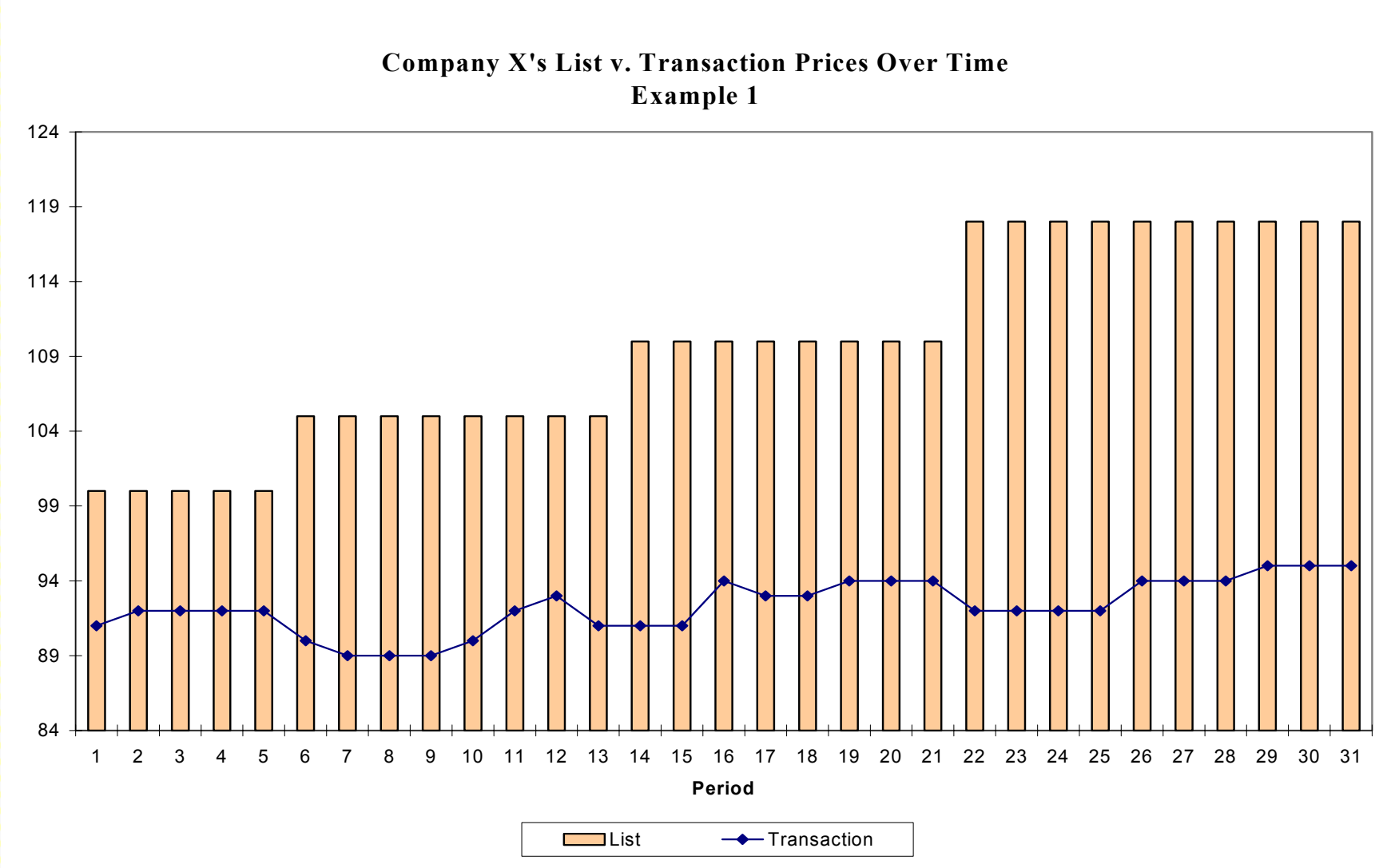
Average Gross Per Diem and Bookings by Months Prior to Sailing for Four Ships Departing the Same Port the same Day on Similar Itineraries (Category X Cabin)



List Prices v. Transaction Prices

- Following slide shows an analysis of changes in list prices v. changes in transaction prices in an industrial products industry.
- The list prices for a particular customer segment are shown by the bars on the chart.
- The actual average prices for the top 25 customers in this segment are shown by the line on the chart.
- This chart shows that transaction prices do not follow list prices systematically.

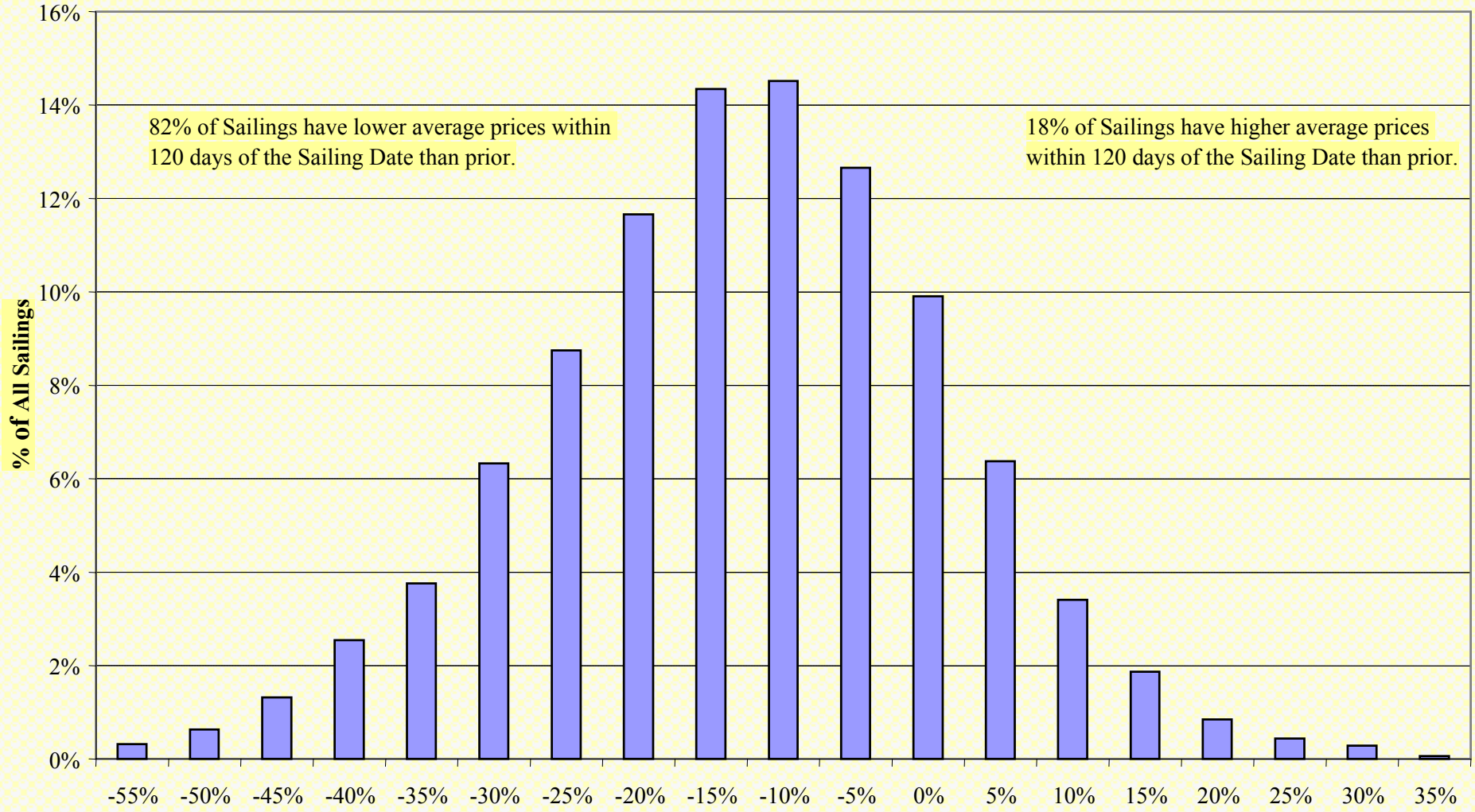
List Prices v. Actual Prices



Relationship Between "Early" and "Later" Transaction Prices

- **Industry: Cruise industry**
- **Purpose: Assess whether there is a systematic relationship between "early" and "later" transaction prices**
- **Data used:**
  - Transaction data from the parties with information on prices paid by passengers
- Method:
  - Determine for each sailing, the percentage difference in average prices paid for all cabins before and after 120 days to sailing.
  - Determine the distribution of this percentage across sailings.

Relative Pricing Before and After 120 Days to Sailing
All Cruises - All Cabins



Customer Turnover

- Following slide shows an analysis of customer turnover in an industrial products industry.

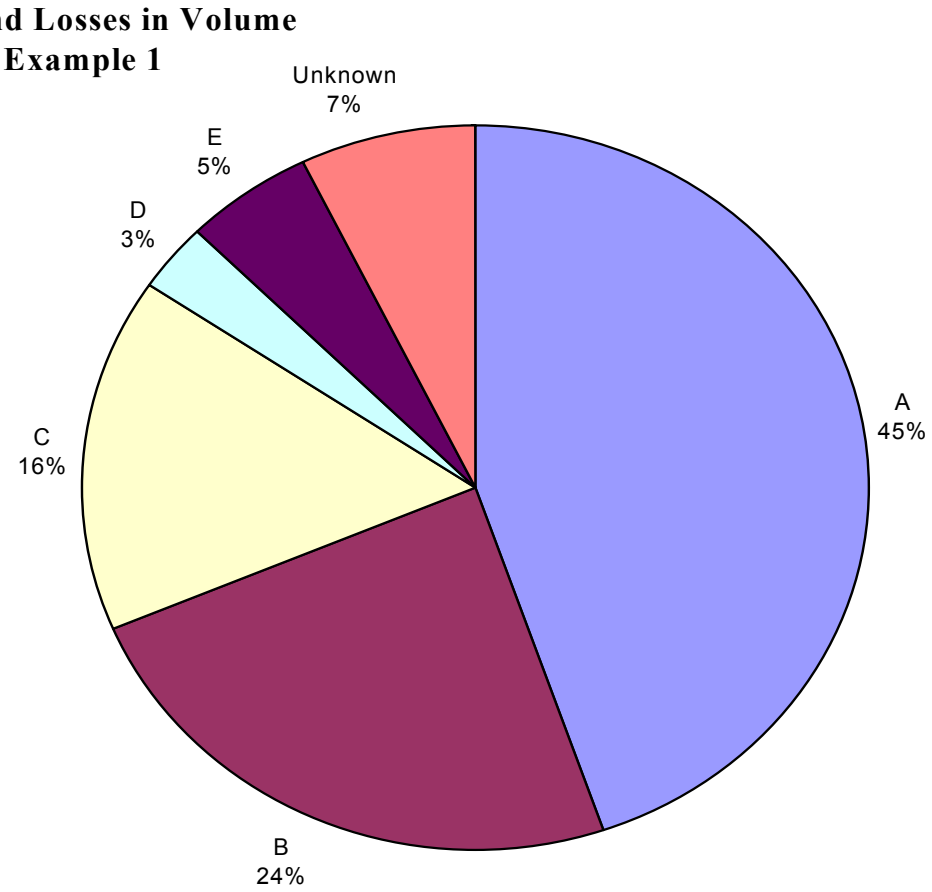
- Company documents contained information on the amount of volume lost (gained) at particular customers and to whom (from whom) the volume was lost (gained).

- The following chart shows this volume (in absolute value) as a percentage of total sales and the distribution of to whom the volume was lost (gained).

Customer Turnover

Company X's Estimate of Gains and Losses as a Percentage of Its Total Sales

19xx	19yy
21%	19%

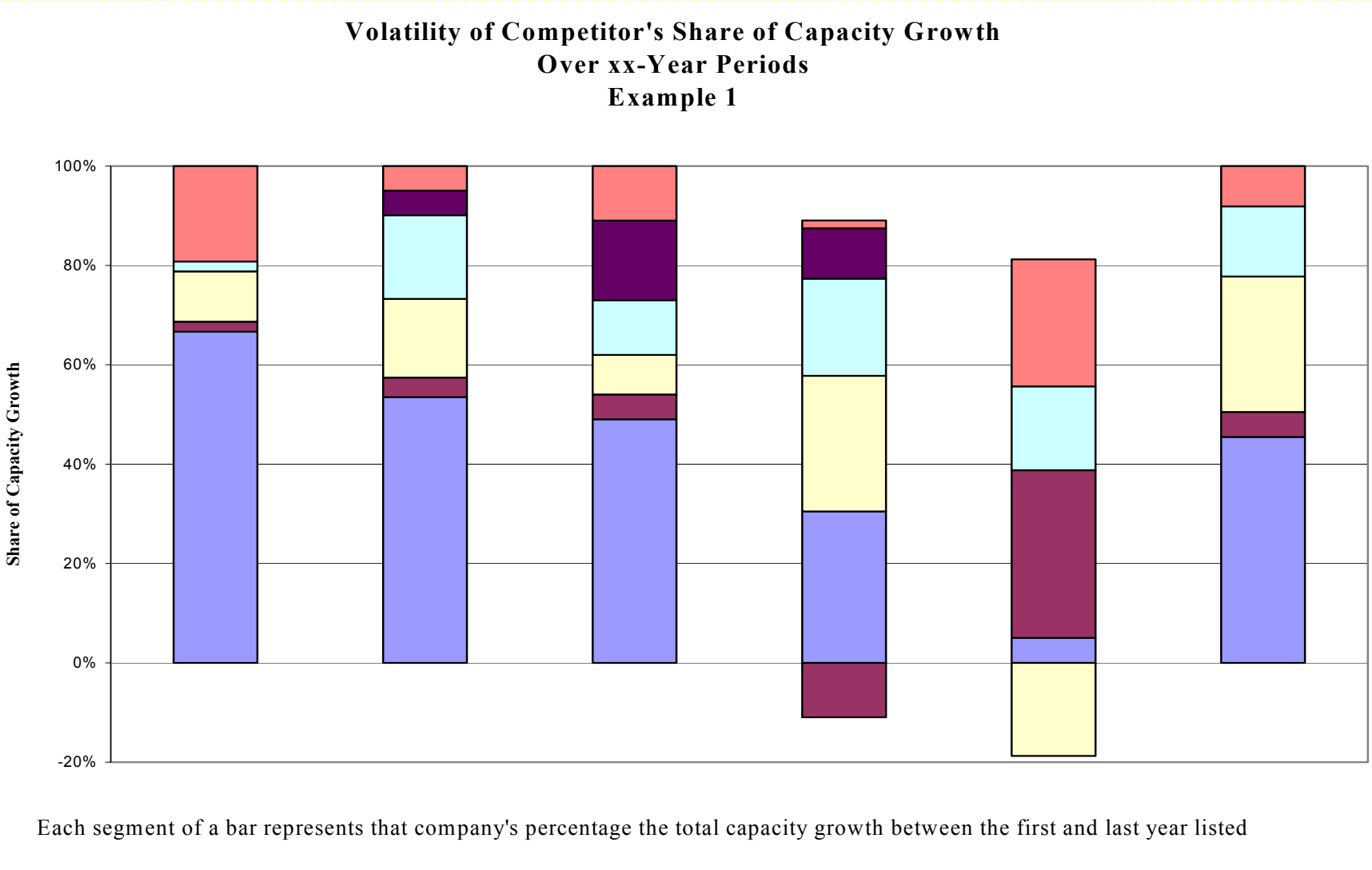


Sources of Company X's Estimated Gained and Lost Volume by Competitor, 19xx

Volatility of Capacity Changes

- Following slide shows an analysis of capacity change in an industrial products industry.
- Actual capacity was collected from the parties along with industry estimates of competitors.
- Capacity growth for each competitor and the industry as a whole was calculated for each year. The share of industry growth for each competitor was then calculated.
- The following chart shows these shares by competitor.
- The results show substantial differences in the timing and size of growth across competitors.

Volatility of Capacity Changes



Examples Regarding Transparency

Transparency of Volume

- Following slide shows a comparison of actual volume with estimates of volume in an industrial products industry.
- One of the parties had documents with estimates by customer of which competitors supplied the customer and how much volume each competitor had.
- For the competitors where we had information, these estimates were compared with actual volumes.
- The following chart shows the extent to which estimates were different from actuals.

Transparency of Volume

Comparison of Company X's Volume Estimates versus Actuals for Two Major Competitors Example 1

	Competitor Y	Competitor Z
Number of customers that Company X Identifies as Supplying	55	46
Number of customers Company X identifies as supplying when did not	22	12
Number of customers Company X does not identify as supplying when did	12	8
Percent of customers for whom Company X's volume estimate was off by more than 20%	75%	82%
Percent of customers for whom Company X's volume estimate was off by more than 60%	39%	47%

Transparency of Price

- Following slide shows a comparison of actual prices with estimates of prices in an industrial products industry.
- Similar to the volume analysis, one of the parties had documents with estimates by customer of which prices charged by competitors.
- For the competitors where we had information, these estimates were compared with actual prices.
- The following chart shows the extent to which estimates were different from actuals.

Transparency of Price

Comparison of Company X's Price Estimates versus Actuals for Two Major Competitors Example 1

	Competitor Y	Competitor Z
Percent of customers for whom Company X's price estimate was greater than the actual price by more than 2%	15%	30%
Percent of customers for whom Company X's price estimate was greater than the actual price by more than 5%	5%	18%
Percent of customers for whom Company X's price estimate was less than the actual price by more than 2%	28%	40%
Percent of customers for whom Company X's price estimate was less than the actual price by more than 5%	8%	28%

Maverick

- Following slide shows an analysis of list price announcements for industrial products industry.
- We gathered information on list price announcements for each of the competitors (based on information from the parties as well as public information).
- We determined who "lead" the price announcement (e.g., was first to to announce) and whether other competitors followed. We looked to see if one company consistent did not lead or follow.
- There appears to be no obvious "maverick" – while Company B never never lead and frequently did not follow, several other companies are are very similar (e.g., Company D)

Maverick: Empirical Evidence